Appendix K

Some of the More Common Formulas Used in the Text

$\mu = \frac{\sum X}{N}$ Mean of a population

$\bar{X} = \frac{\sum X}{n}$ Mean of a sample

$\sigma^2 = \frac{\sum (X - \mu)^2}{N}$ Variance of a population

$s^2 = \frac{\sum (X - \bar{X})^2}{n - 1}$ Variance of a sample

$\sigma = \sqrt{\frac{\sum (X - \mu)^2}{N}}$ Standard deviation of a population

$s = \sqrt{\frac{\sum (X - \bar{X})^2}{n - 1}}$ Standard deviation of a sample

$\sigma_{\bar{X}} = \frac{\sigma}{\sqrt{n}}$ Standard error of the mean

$s_{\bar{X}} = \frac{s}{\sqrt{n}}$ Estimate of the standard error of the mean

$S_p = \sqrt{\frac{P(1 - P)}{n}}$ Estimate of the standard error of the proportio

$CI = \bar{X} \pm Z(\sigma_{\bar{X}})$ Confidence interval for the mean (σ known)

$CI = \bar{X} \pm t(s_{\bar{x}})$ Confidence interval for the mean (σ unknown)

$CI = P \pm Z(s_p)$ Confidence interval for the proportion

$\bar{D} = \frac{\sum d}{n}$ Mean difference

$s_d = \sqrt{\frac{\sum (d - \bar{D})^2}{n - 1}}$ Standard deviation of the differences

$s_{\bar{D}} = \frac{s_d}{\sqrt{n}}$ Estimate of the standard error of the mean difference

$s_{\bar{X}_1 - \bar{X}_2} = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} \cdot \left[\frac{1}{n_1} + \frac{1}{n_2}\right]}$ Estimate of the standard error of the difference betu means

$Z = \frac{X - \mu}{\sigma}$ Conversion of a raw score in a population to a Z score

$Z = \frac{X - \bar{X}}{s}$ Conversion of a raw score in a sample to a Z score

$Z = \frac{\bar{X} - \mu}{\sigma_{\bar{X}}}$ Single sample test involving a mean with σ known

$t = \frac{\bar{X} - \mu}{S_{\bar{X}}}$ Single sample test involving a mean with σ unknown

$t = \frac{\bar{D}}{S_{\bar{D}}}$ Two sample test involving mean difference (matched or related samples)

$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{X}_1 - \bar{X}_2}}$ Two sample test involving difference between means (independent samples)

$F = \frac{MS_B}{MS_W}$ F ratio for Analysis of Variance

$MS_B = \frac{SS_B}{df_B}$ Mean square between

$MS_W = \frac{SS_W}{df_W}$ Mean square within

$\chi^2 = \sum \left[\frac{(f_0 - f_e)^2}{f_e}\right]$ Chi-Square Test

$r = \frac{\sum (Z_X \cdot Z_Y)}{n - 1}$ Correlation Coefficient